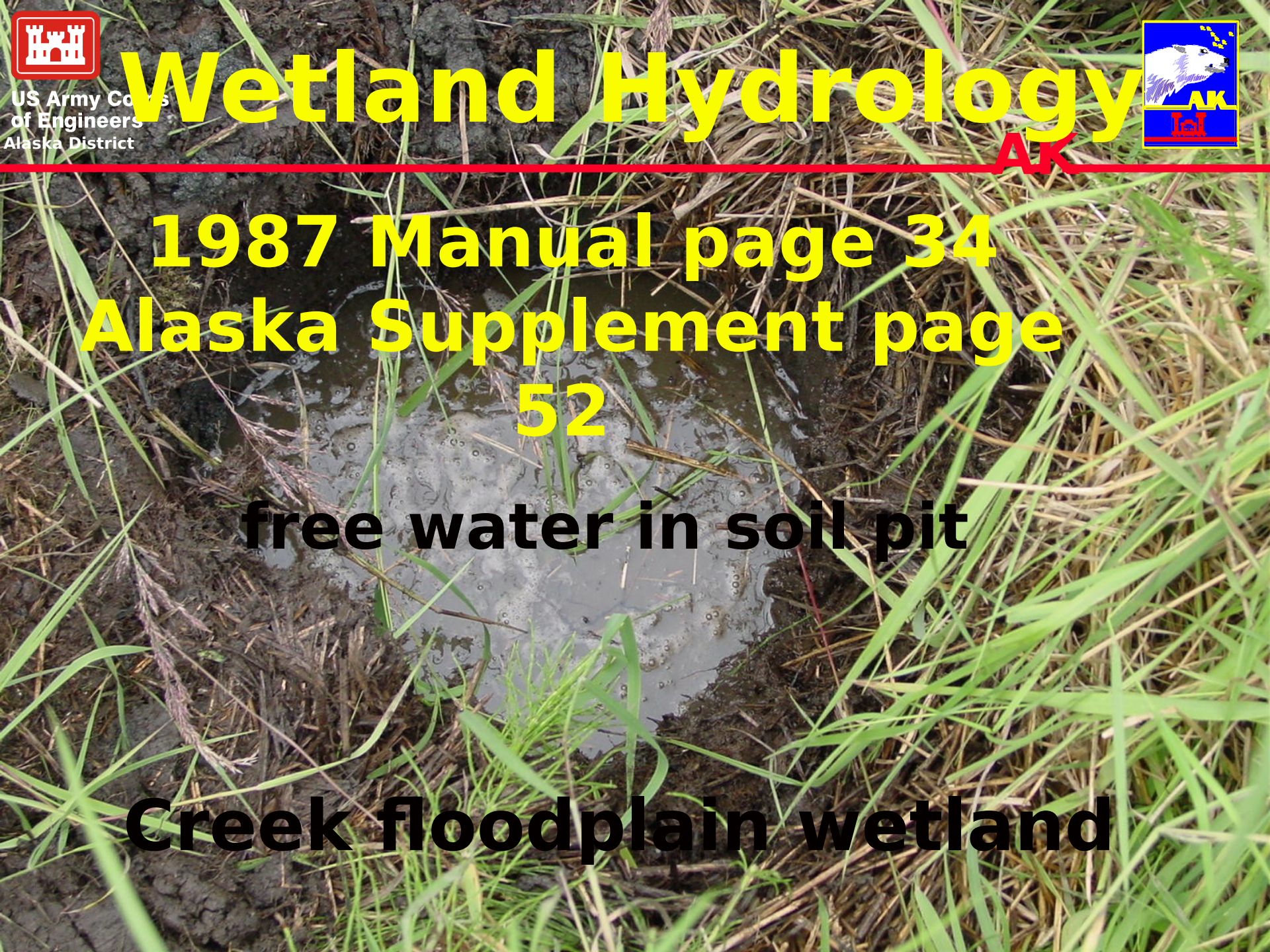
US Army Corps
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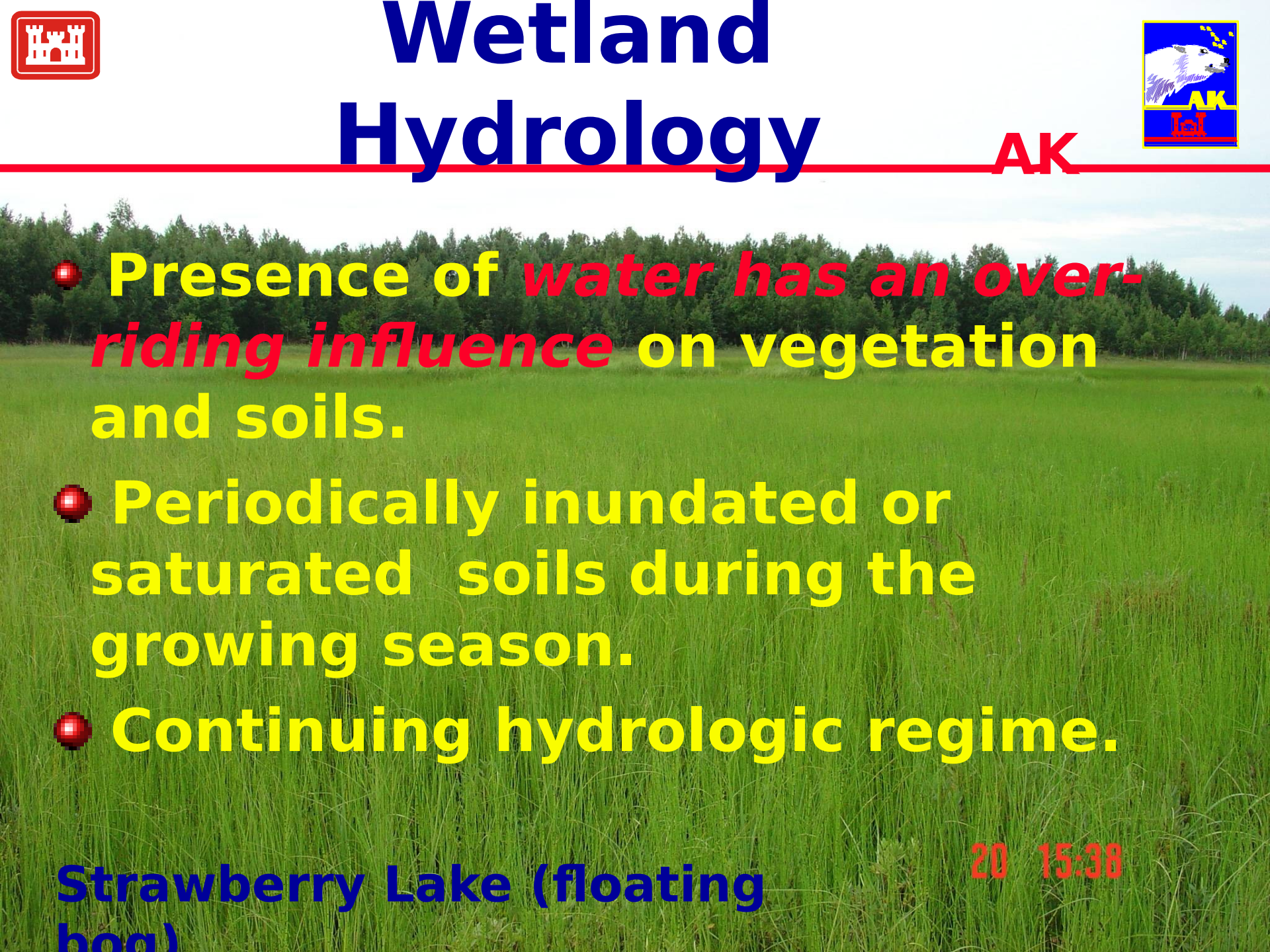
Alaska District
Wetland Hydrology
AK
1987 Manual page 34
Alaska Supplement page
52
free water in soil pit
Creek floodplain wetland

Wetland Hydrology

AK

- Presence of *water has an over-riding influence* on vegetation and soils.
- Periodically inundated or saturated soils during the growing season.
- Continuing hydrologic regime.

Strawberry Lake (floating bog)



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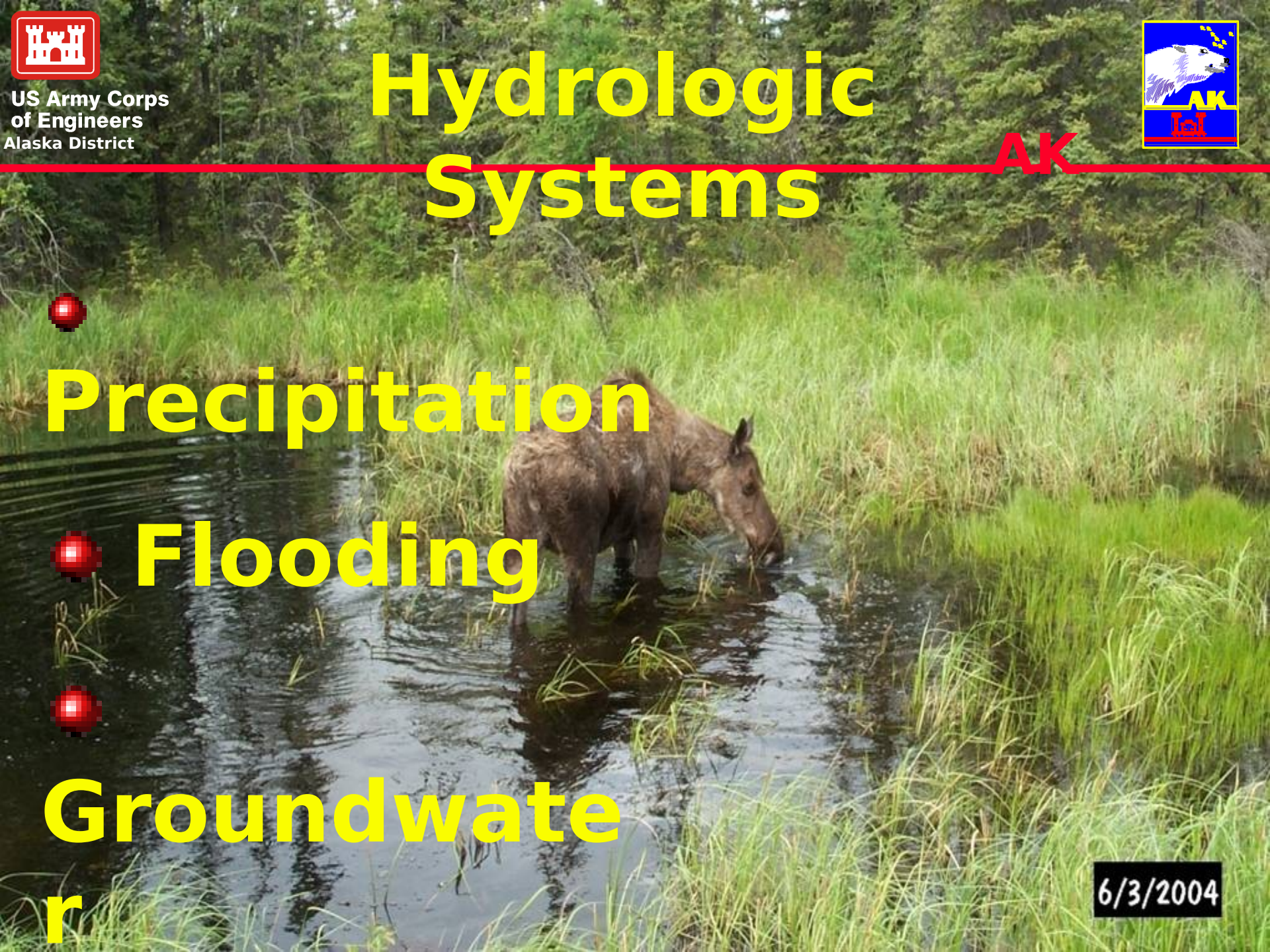
Wetland Hydrology

AK

Objective: Understand hydrology characteristic in making wetland determinations.

How much water makes a wetland?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of Engineers
Alaska District
Hydrologic Systems
AK
AK
Precipitation
Flooding
Groundwate
r
6/3/2004

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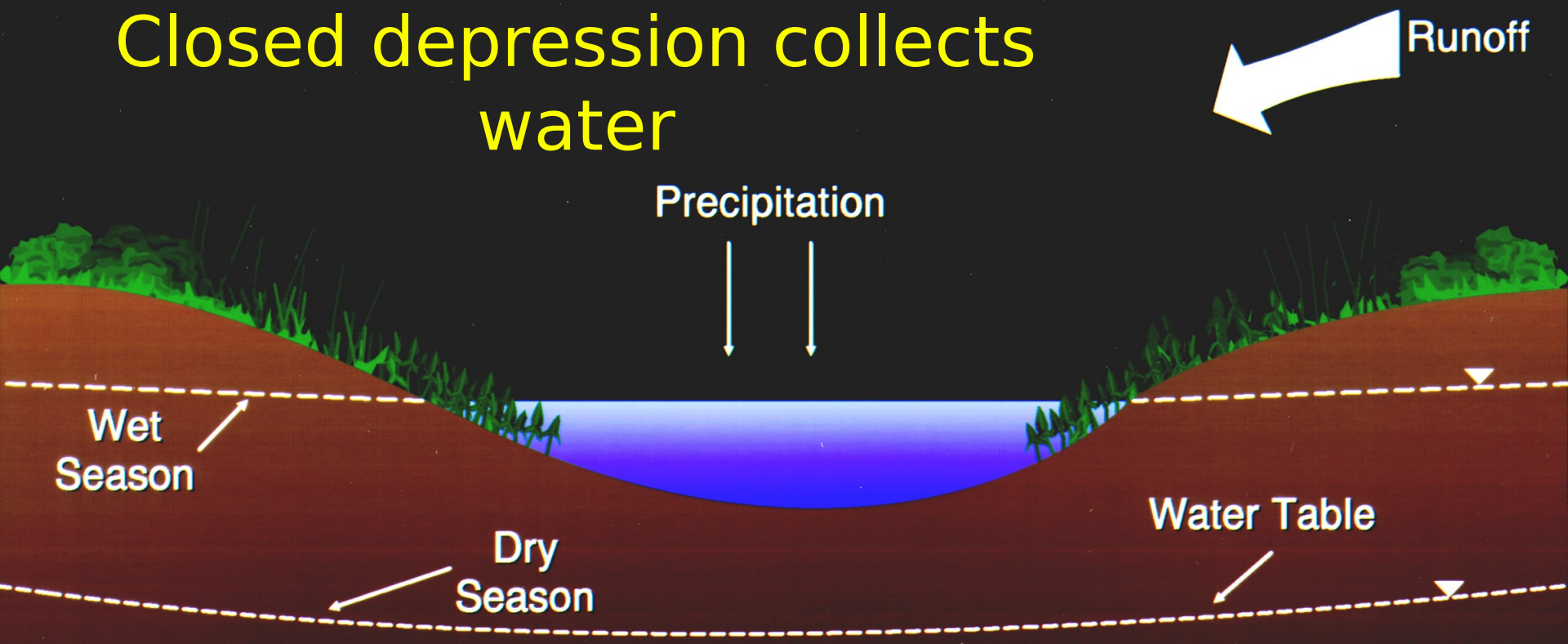
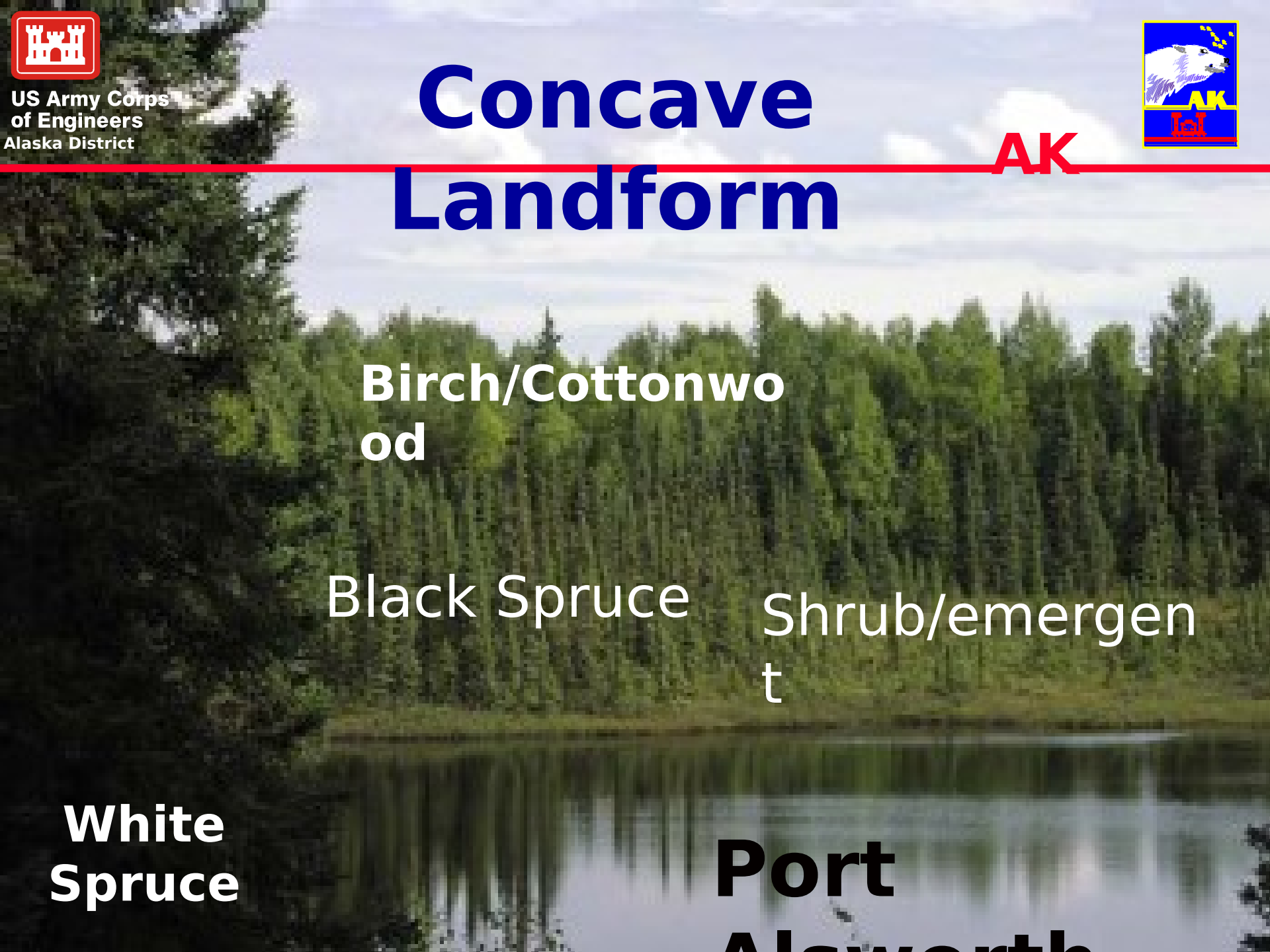
Precipitation wetlands

AK

Closed depression collects water



Water table aquifer free to rise & fall.
Permanent or seasonal waters.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Concave Landform
AK
Birch/Cottonwood
Black Spruce
Shrub/emergent
White Spruce
Port

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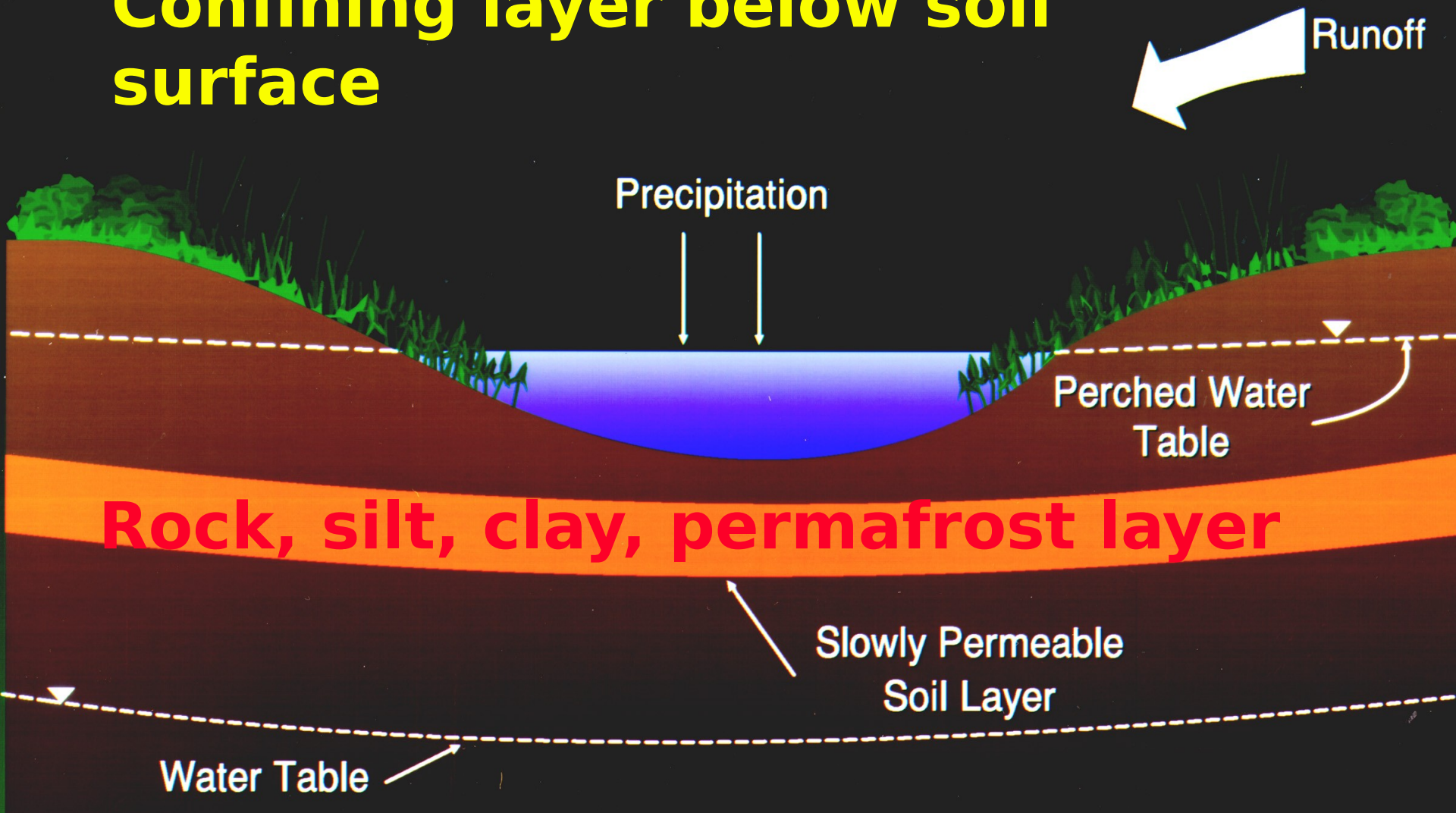
Alaska District

Precipitation & Infiltration

AK

Confining layer below soil surface



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of Engineers
Alaska District
Impermeable Soil
AK
Permafrost layer
20
60
80

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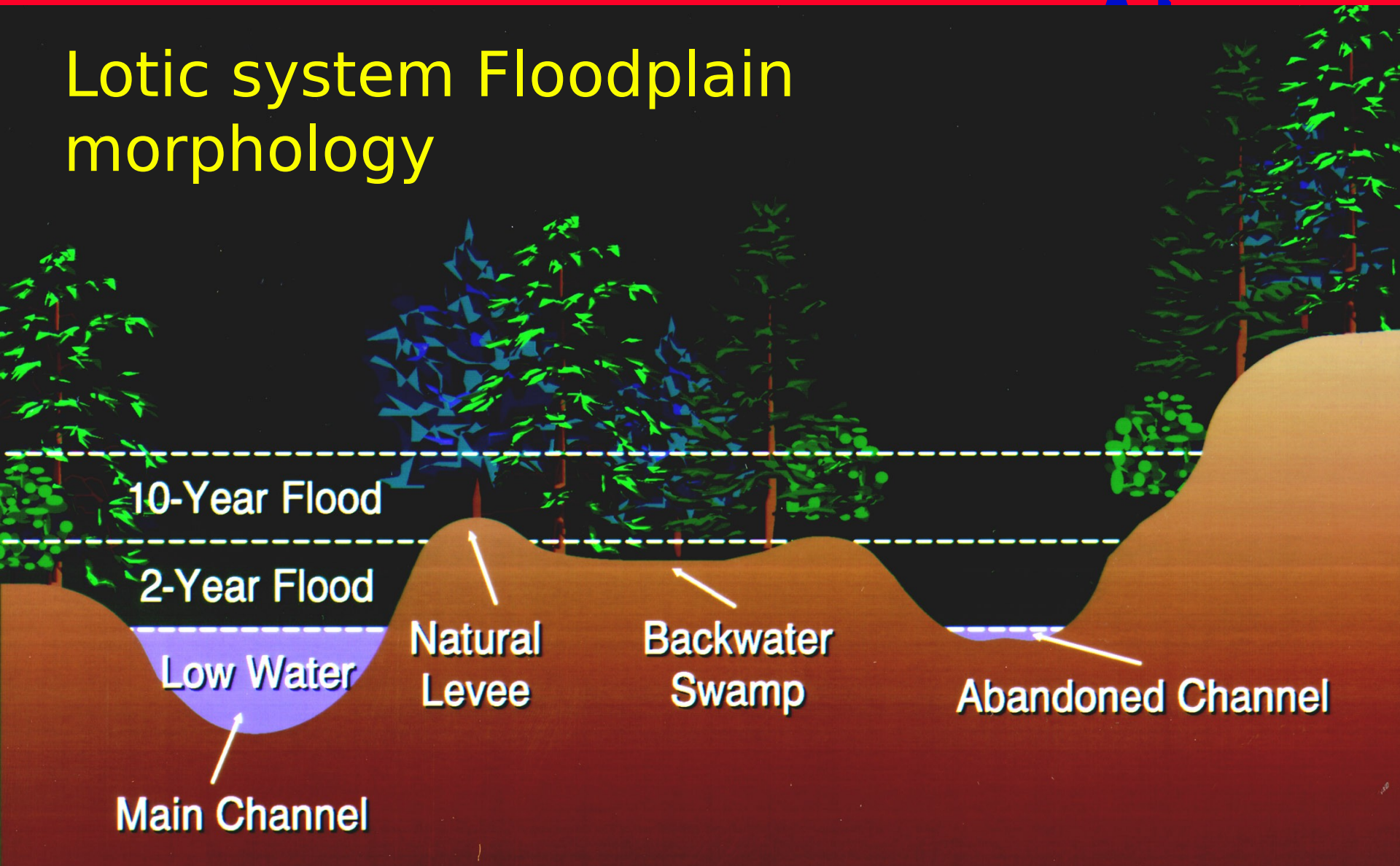
Flooding

AK

Lotic system Floodplain morphology



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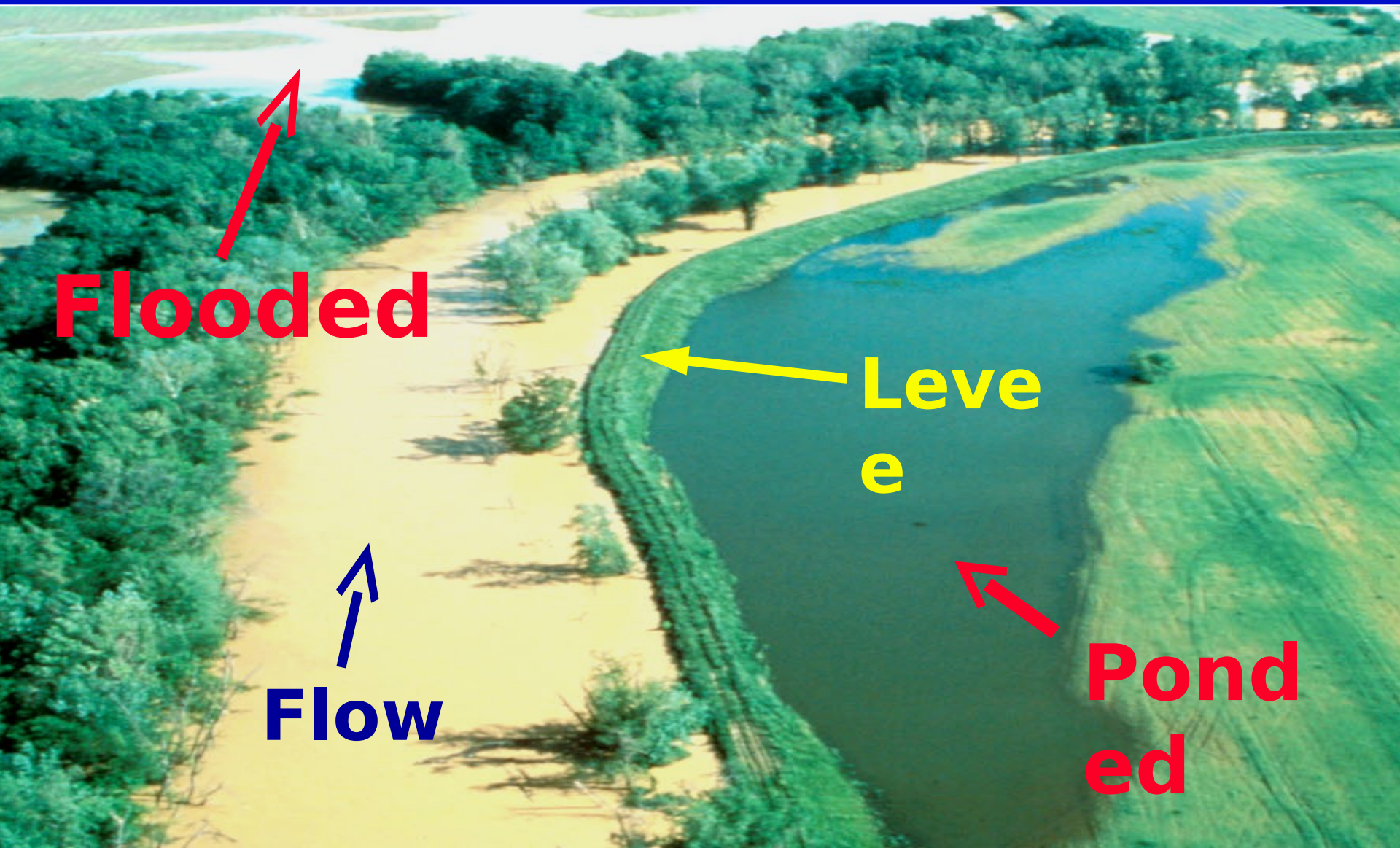
Flooding & Ponding

AK



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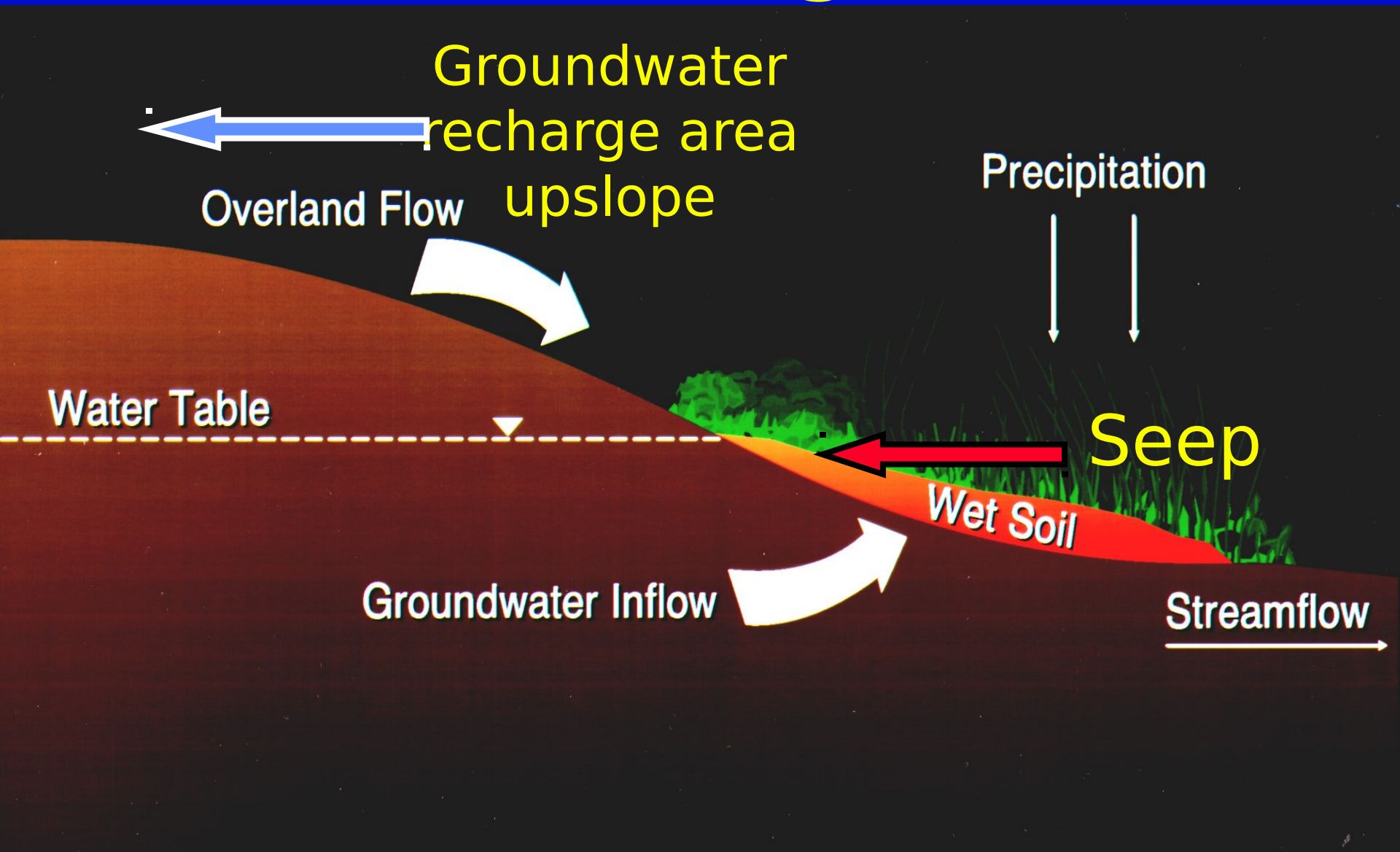
Groundwater Discharge

AK



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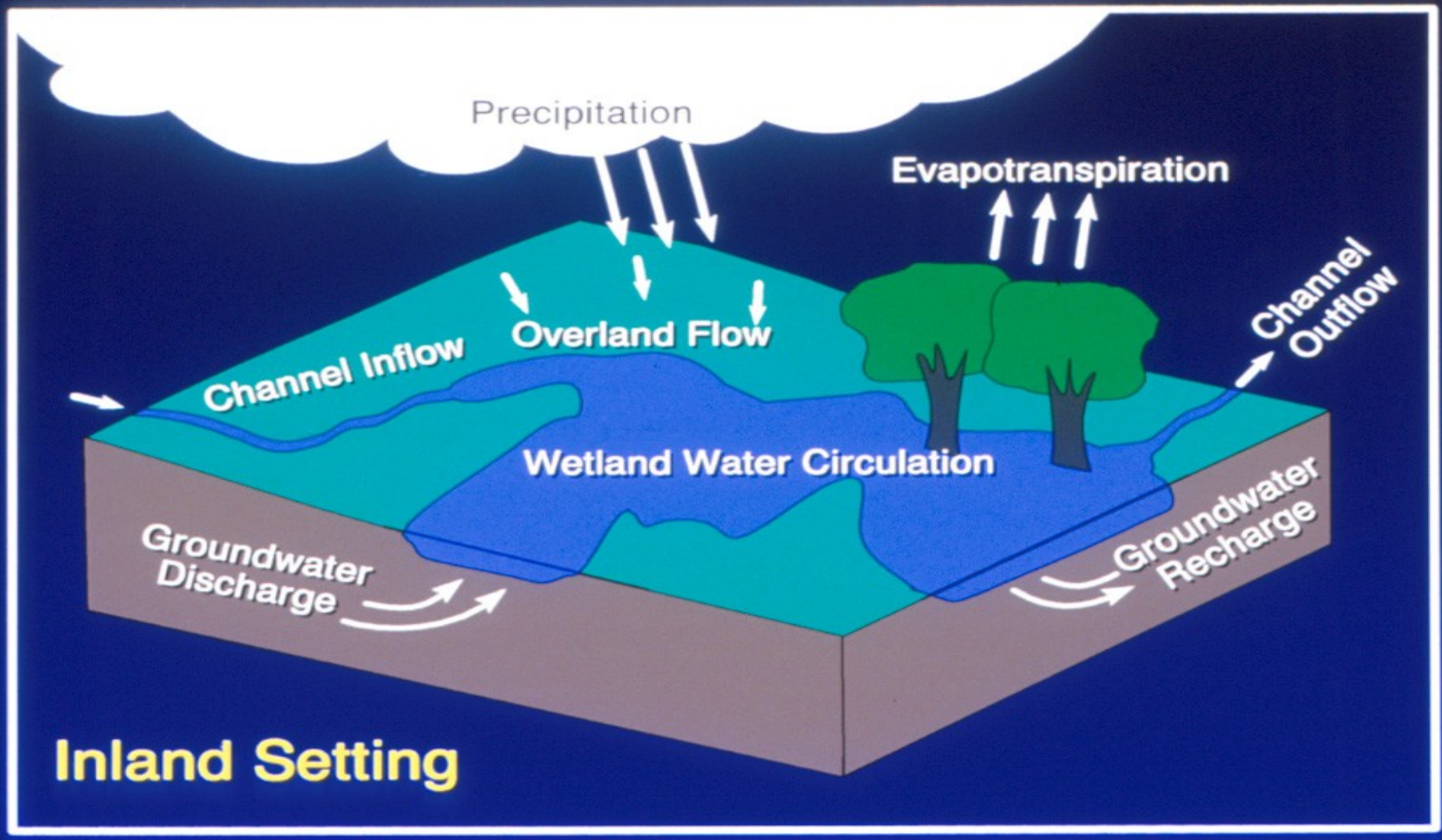
Hydrologic Systems

AK



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Field Indicators

AK

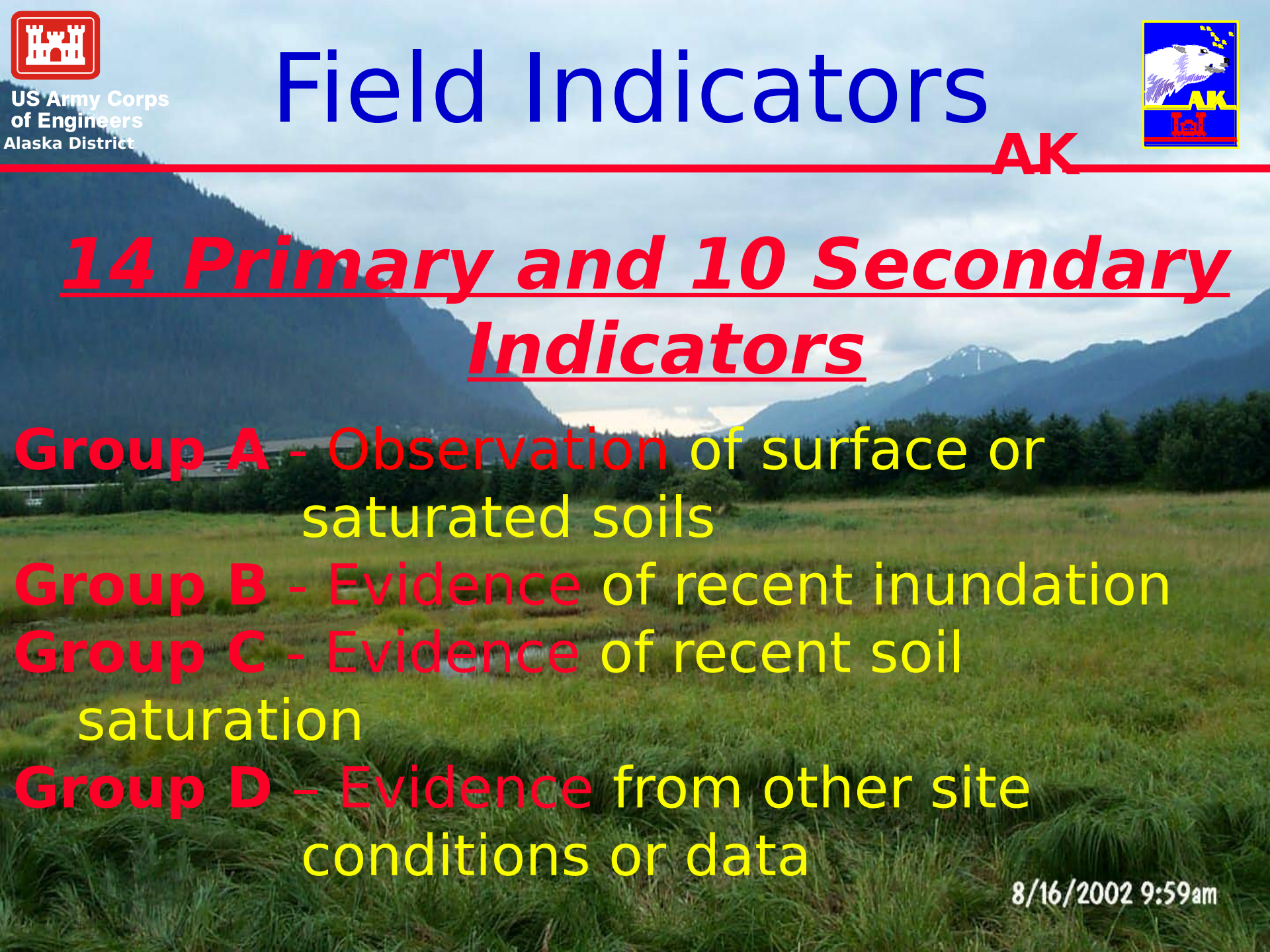
14 Primary and 10 Secondary Indicators

Group A - Observation of surface or saturated soils

Group B - Evidence of recent inundation

Group C - Evidence of recent soil saturation

Group D – Evidence from other site conditions or data



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Group A

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Observation of Surface Water or Saturated Soils

All Group A indicators are primary

Surface water-visual

High water table-in soil pit

Saturation-in soil pit upper 12”

06.02.2005 14:23

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Wetland Hydrology

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Observation of Surface Wat

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High Water Table

AK

Wrangell Muskeg

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Soil Saturation

Group B

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Evidence of Recent Inundation

- Water marks
- Sediment deposits
- Drift deposits
- Mat or Crust of algae
- Iron deposits
- Surface soil cracks

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Wetland Hydrology

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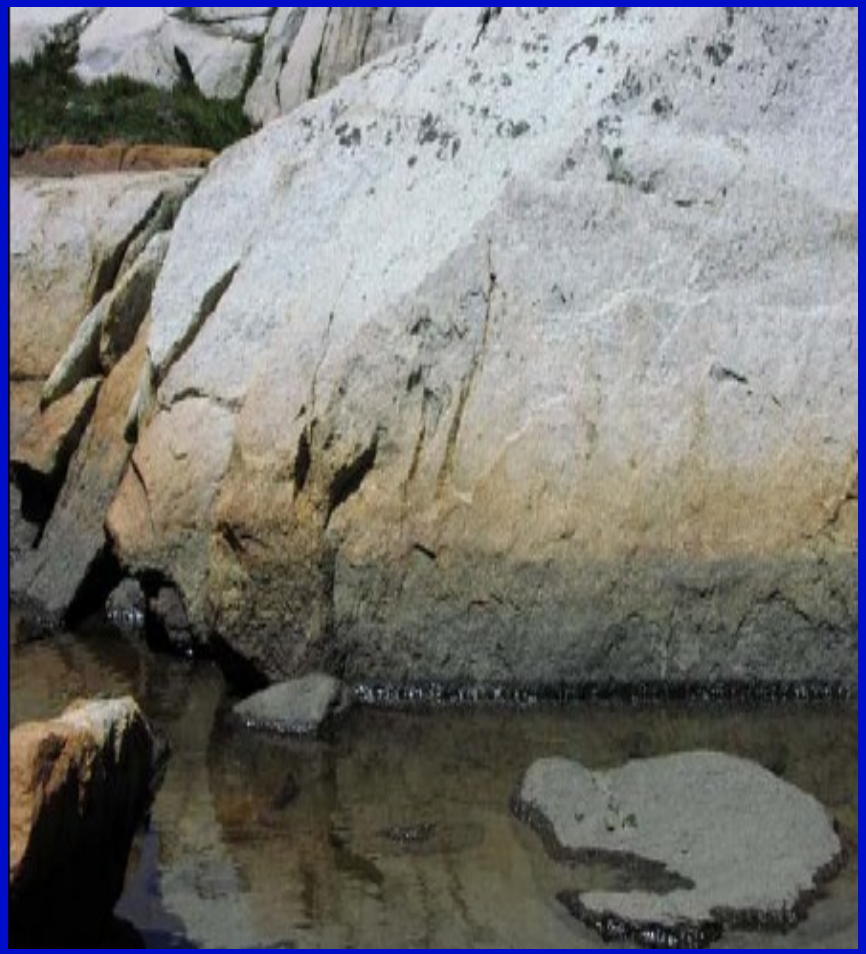
Water Marks



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Sediment Deposits

AK

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Wetland Hydrology

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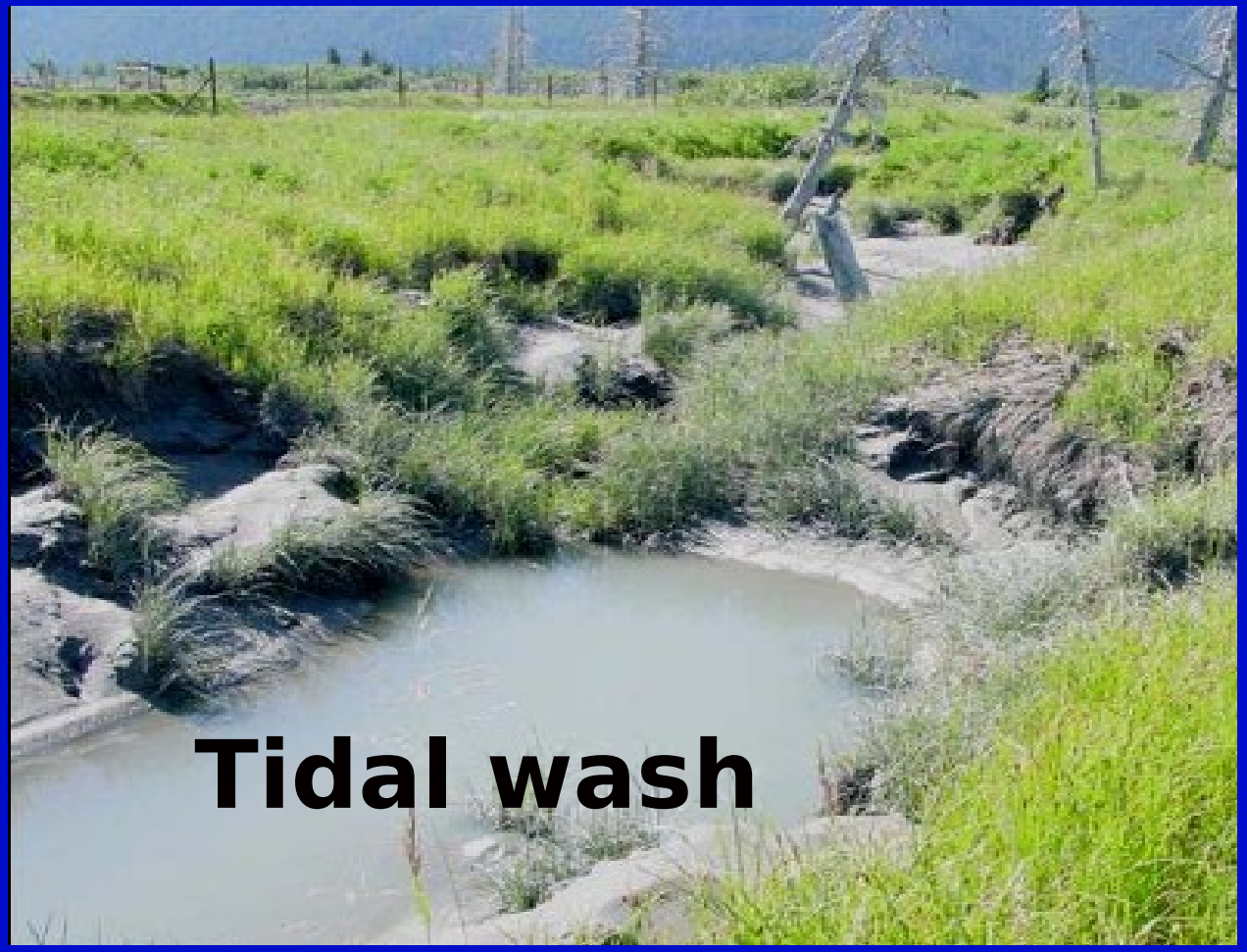
Sediment Deposits



Drift Deposits

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Algal Mat or Crust

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Iron Deposits

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Wetland Hydrology

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Iron Deposits

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Surface Soil Cracks

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Silts deposited by drainage waters over organic soil.

Evidence of recent inundation

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Hydrology Group B

AK

Evidence of Recent Inundation continued)

- Inundation visible on aerial imagery - primary
- Sparsely vegetated concave surface – primary
- Marl deposits - primary
- Water stained leaves – secondary
- Drainage patterns – secondary

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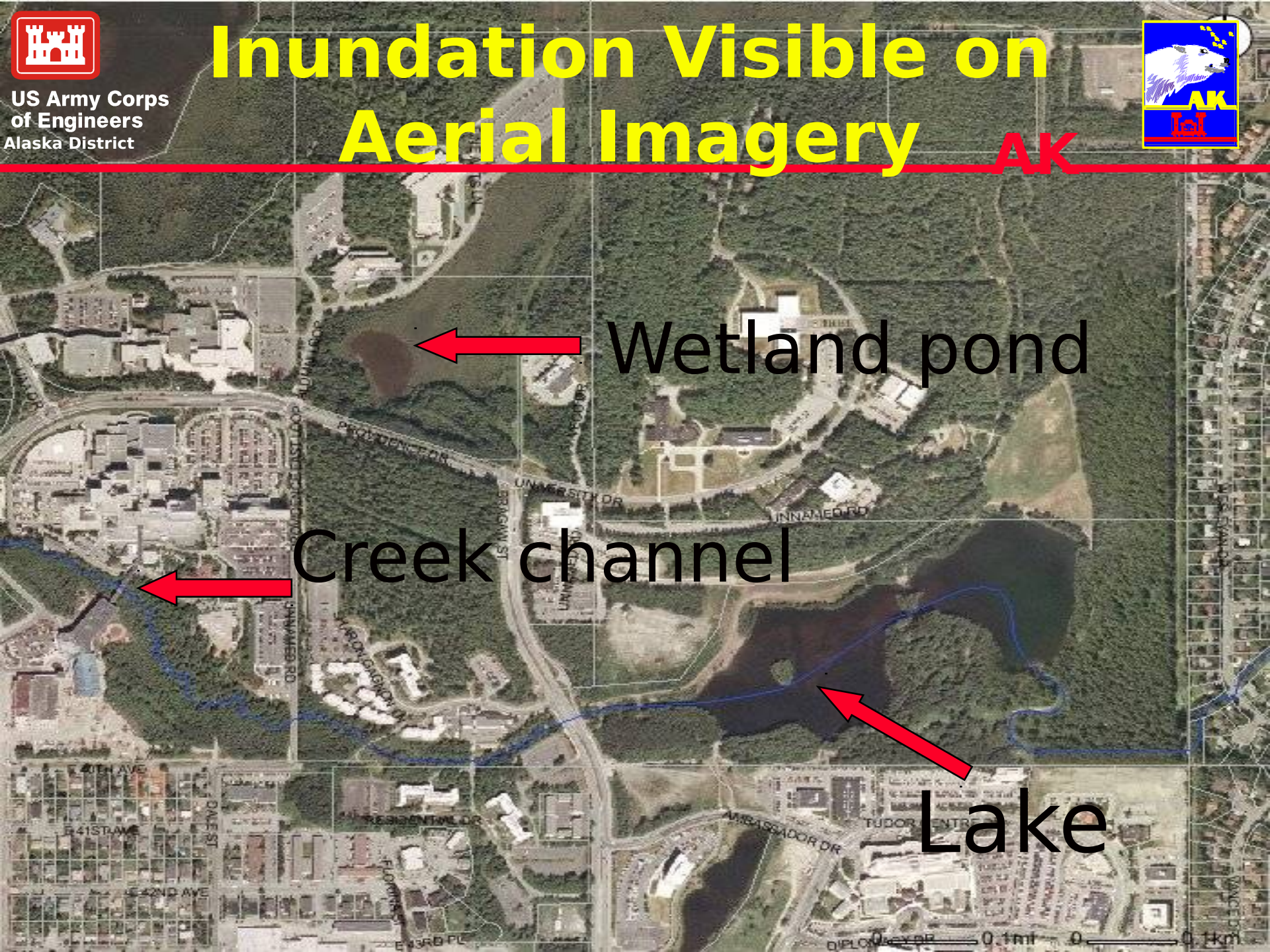
Inundation Visible on Aerial Imagery

AK



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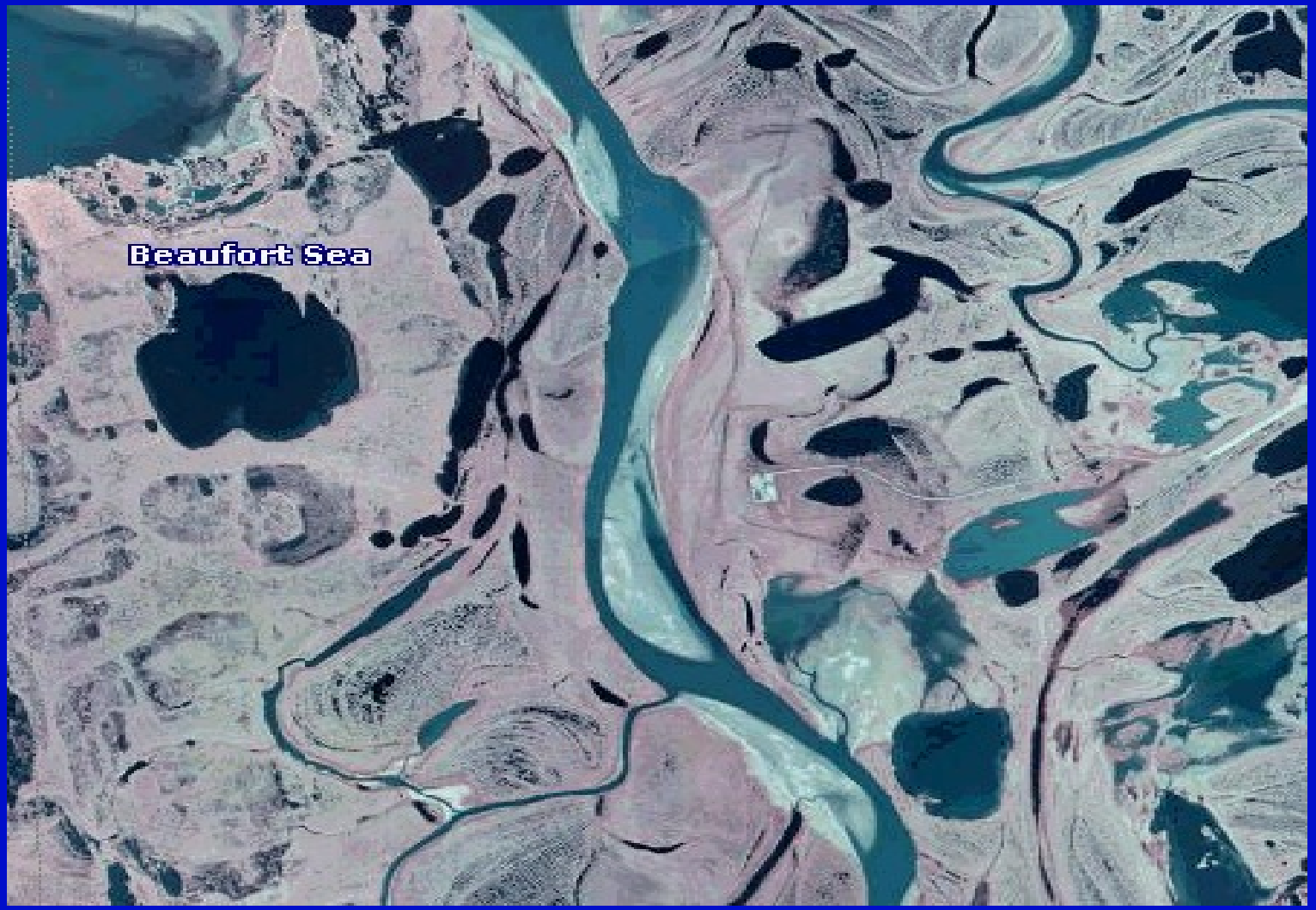
Inundation Visible on Aerial Imagery

AK



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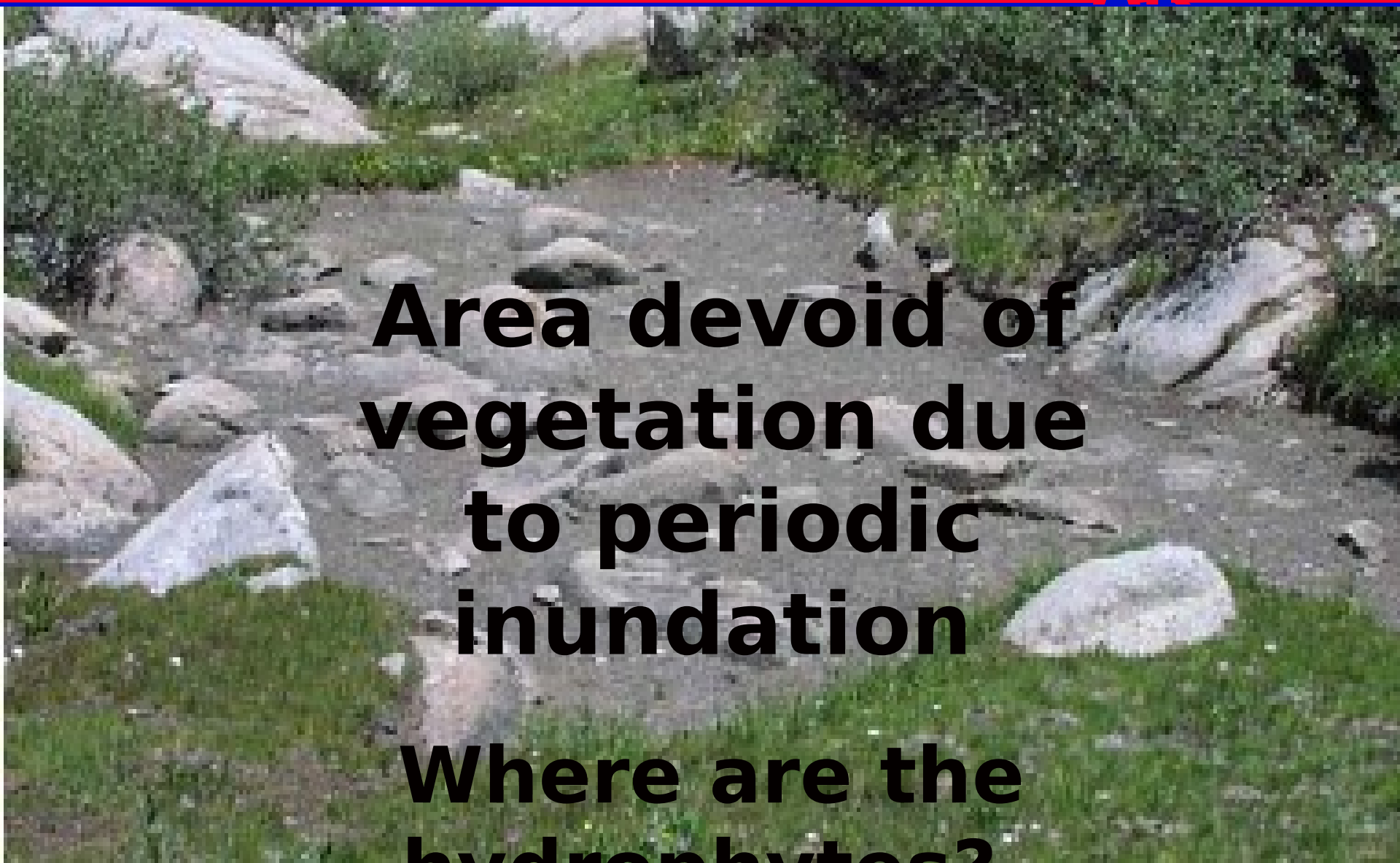
Sparsely Vegetated Concave Surface

AK



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Water Stained Leaves
AK
Black leaves
Brown
Creek floodplain
2006 6 20

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Drainage Patterns

AK

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Drainage Patterns

AK

Wet season drainage pattern following foot trail to Lake

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Marl Deposits

AK

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Group C

AK

Evidence of Recent Soil Saturation

- Hydrogen Sulfide Odor - primary
- Dry-Season Water Table - primary
- Oxidized Rhizospheres along
  - Living roots - secondary
  - Reduced Iron – secondary

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Wetland Hydrology

AK

Hydrogen Sulfide (H_2S) Odor

Indicator of “real-time” hydrology in the soil due to prolonged extreme saturation and anaerobic conditions.

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Dry-Season Water Table

AK

Used during the dry season to estimate the height of soil saturation during the wet season. Look deeper into your soil pit. Used where a widely fluctuating water table occurs through wet & dry conditions.

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Wetland Hydrology

AK

Dry Season Water Table

12 - 24” in mineral soils &
12 - 40” in organic soils
during the “dry season”.

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Oxidized Root Channels

AK

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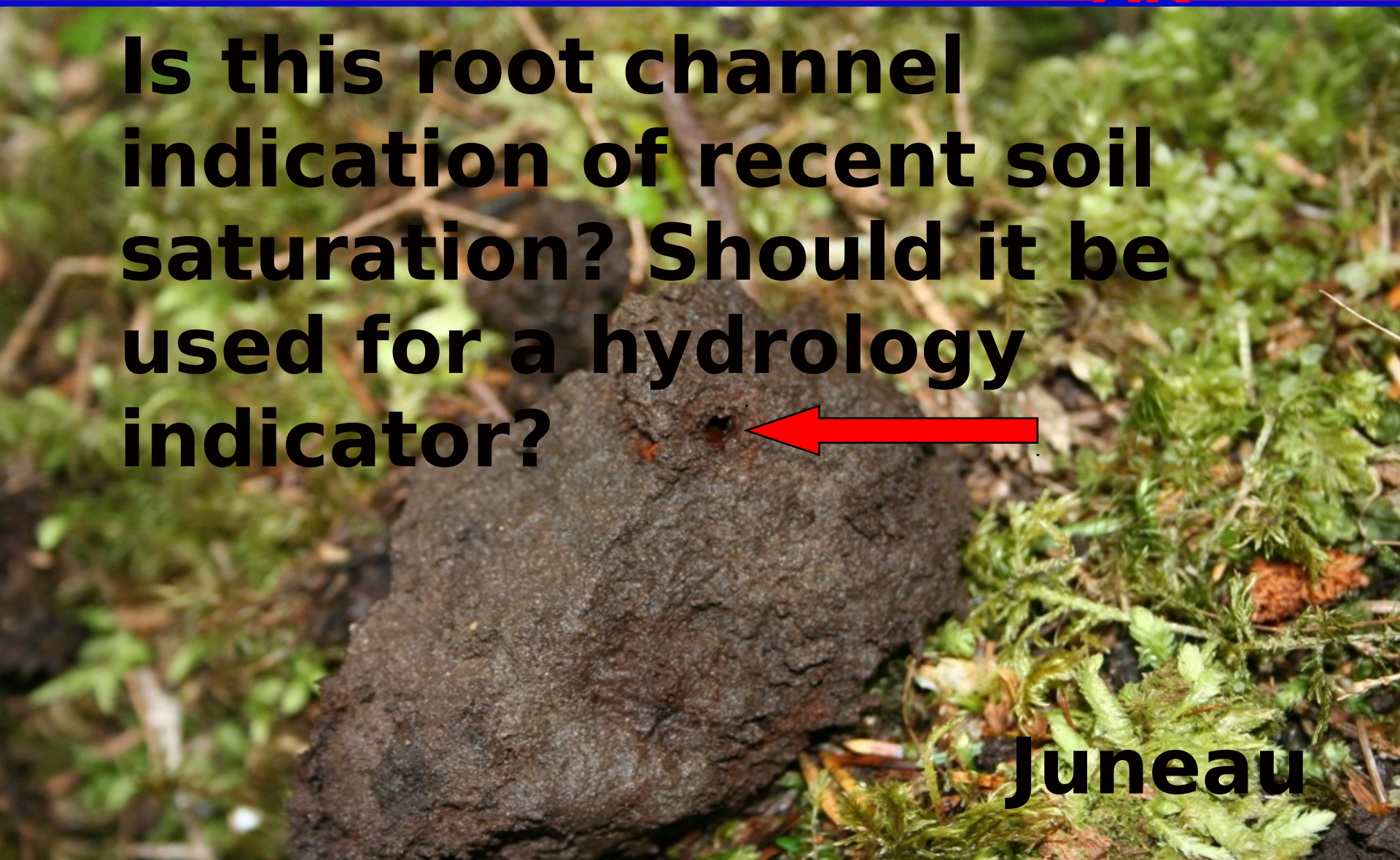
Oxidized Root Channel

AK



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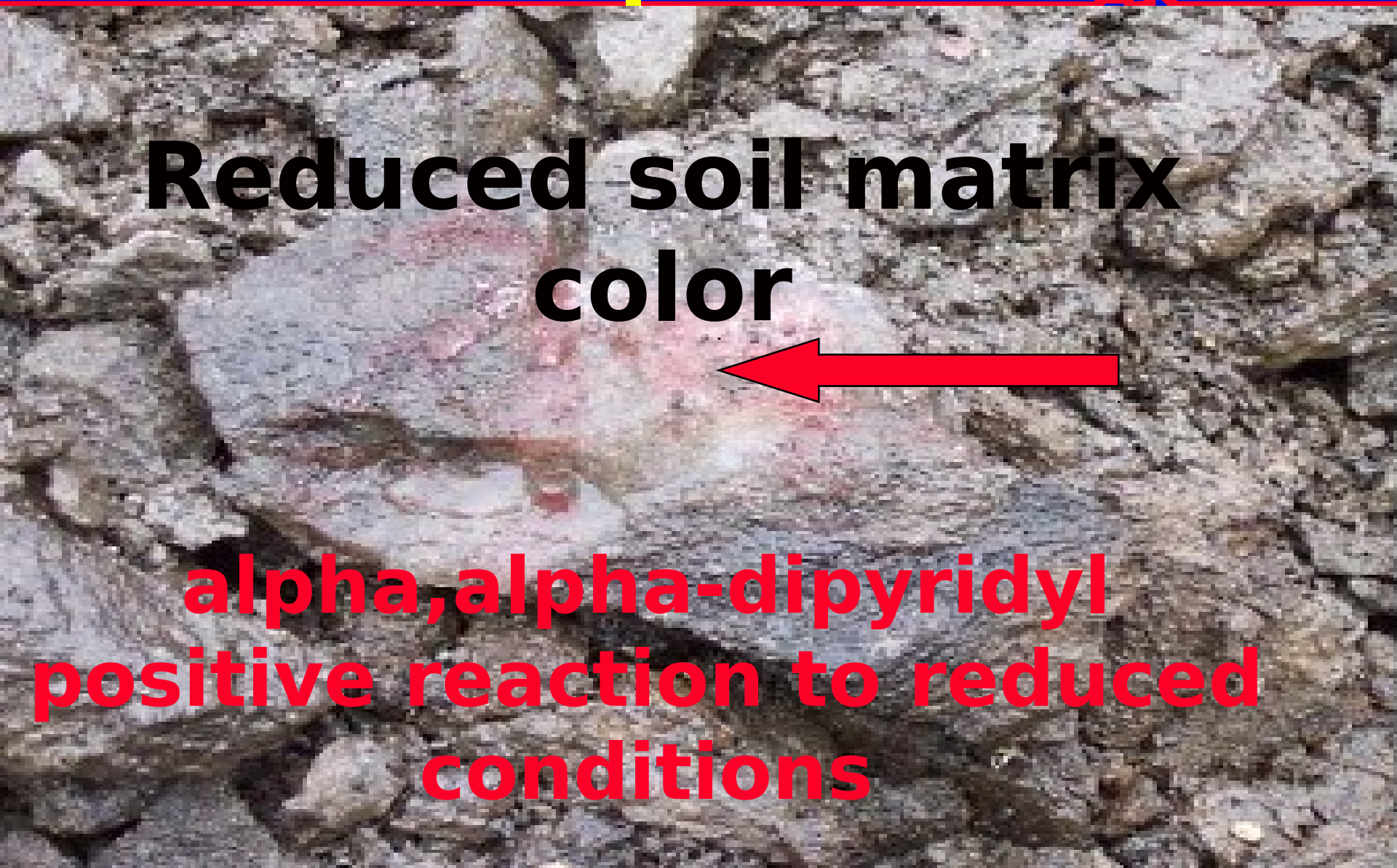
Presence of Reduced

AK



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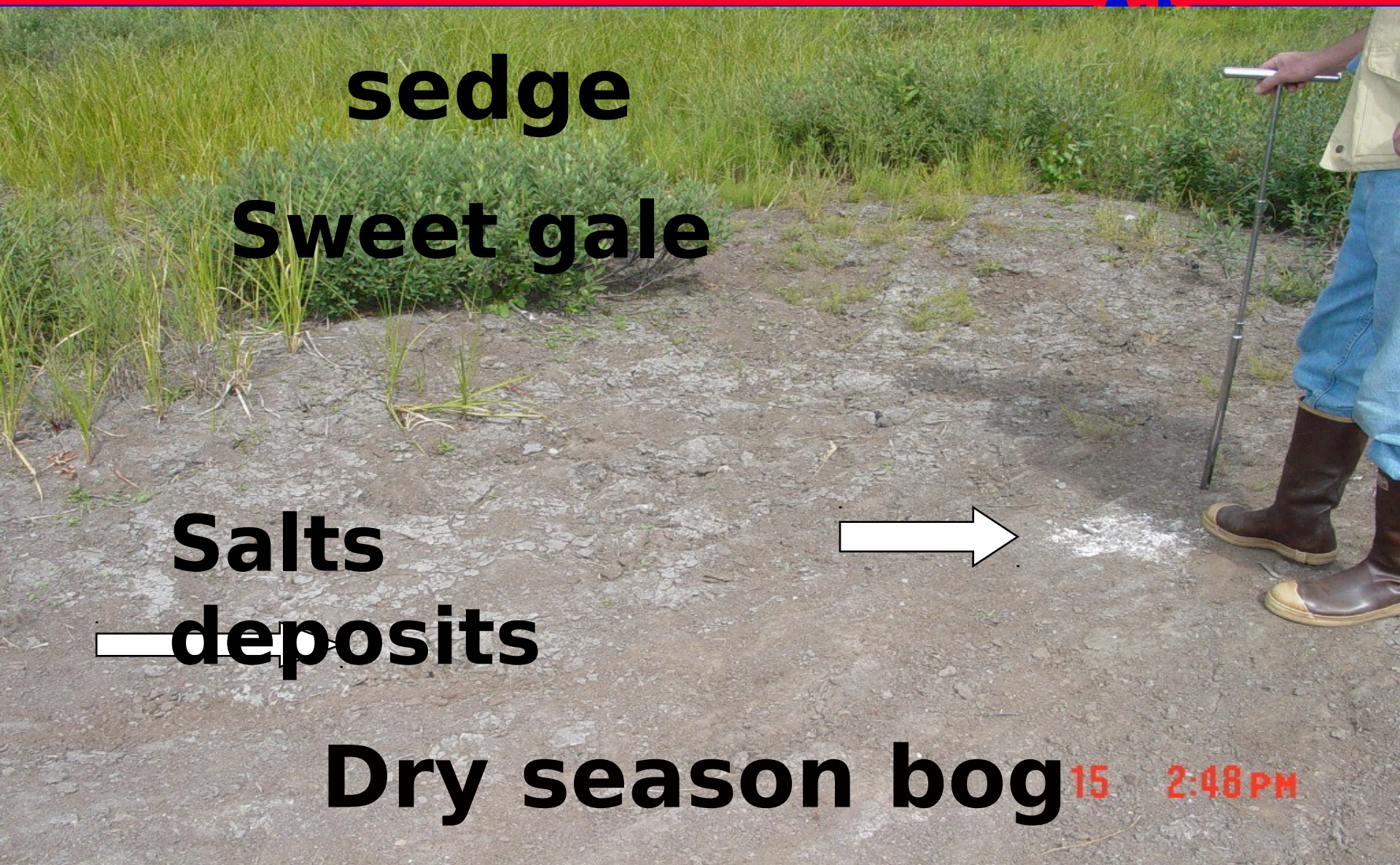
Salt Deposits

AK



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Group D

AK

Evidence from Other Site Conditions or Data

All Group D indicators are secondary

- **Stunted or Stressed Plants**
- **Geomorphic Position**
- **Shallow Aquitard**
- **Microtopographic Relief**
- **Fac-Neutral Test** **Palmer**

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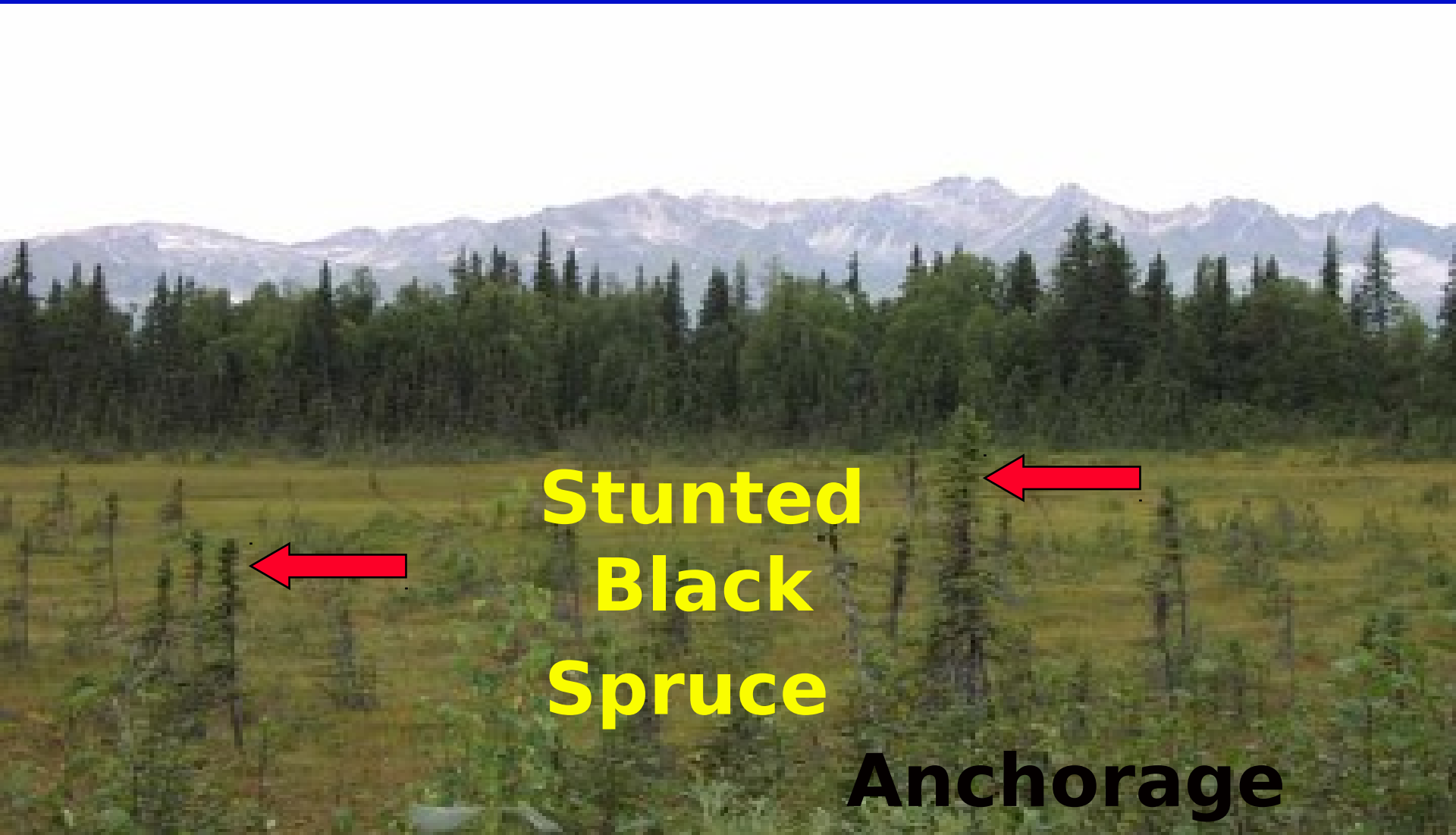
Stunted or Stressed Plants

AK



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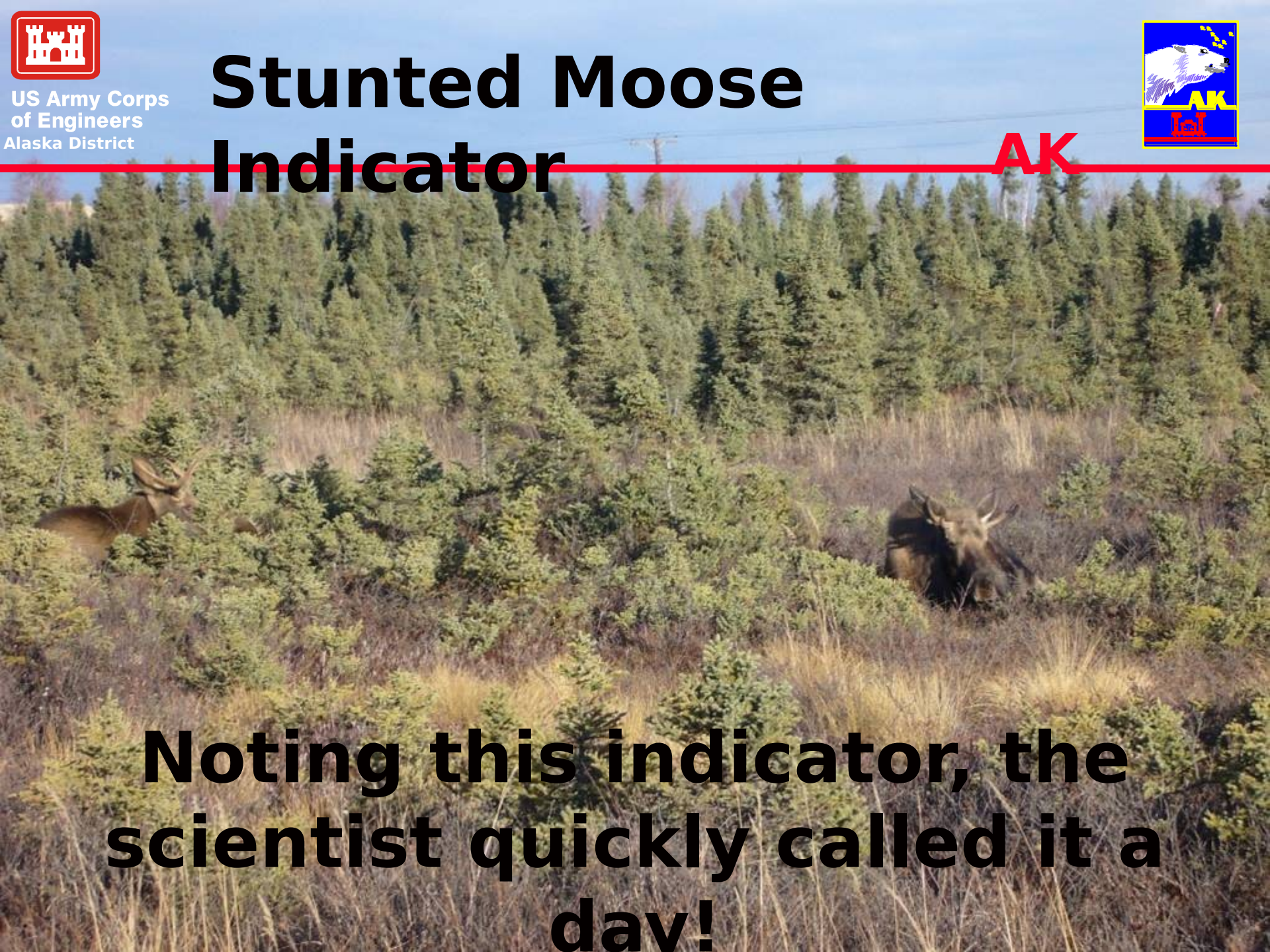
Stunted Moose Indicator

AK



Noting this indicator, the scientist quickly called it a day!

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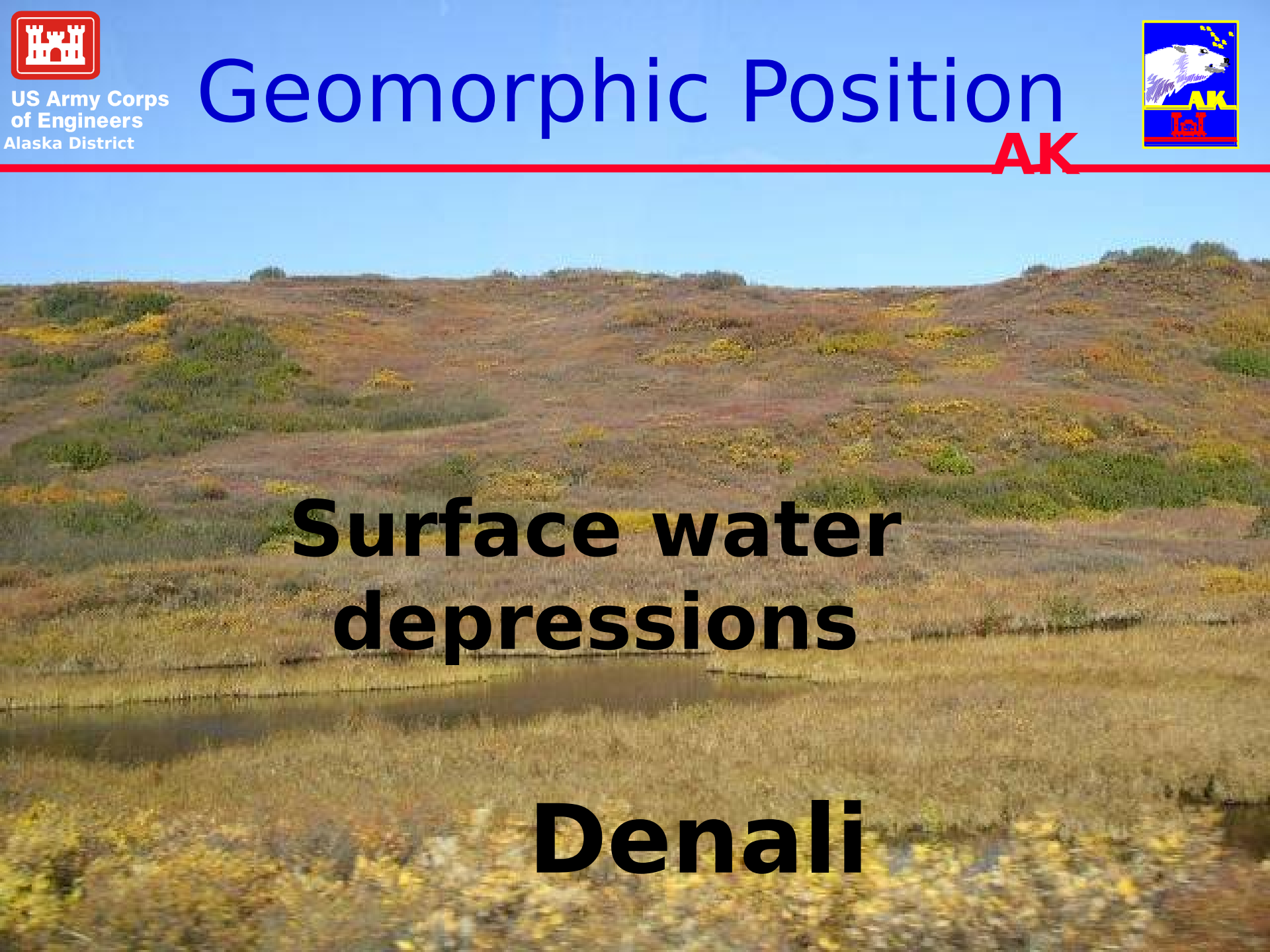
Geomorphic Position

AK



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Wetland Hydrology

AK

Geomorphic Position on the

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Shallow
Aquitard
AK
Organic soil layer
Mineral soil layer
Petersburg

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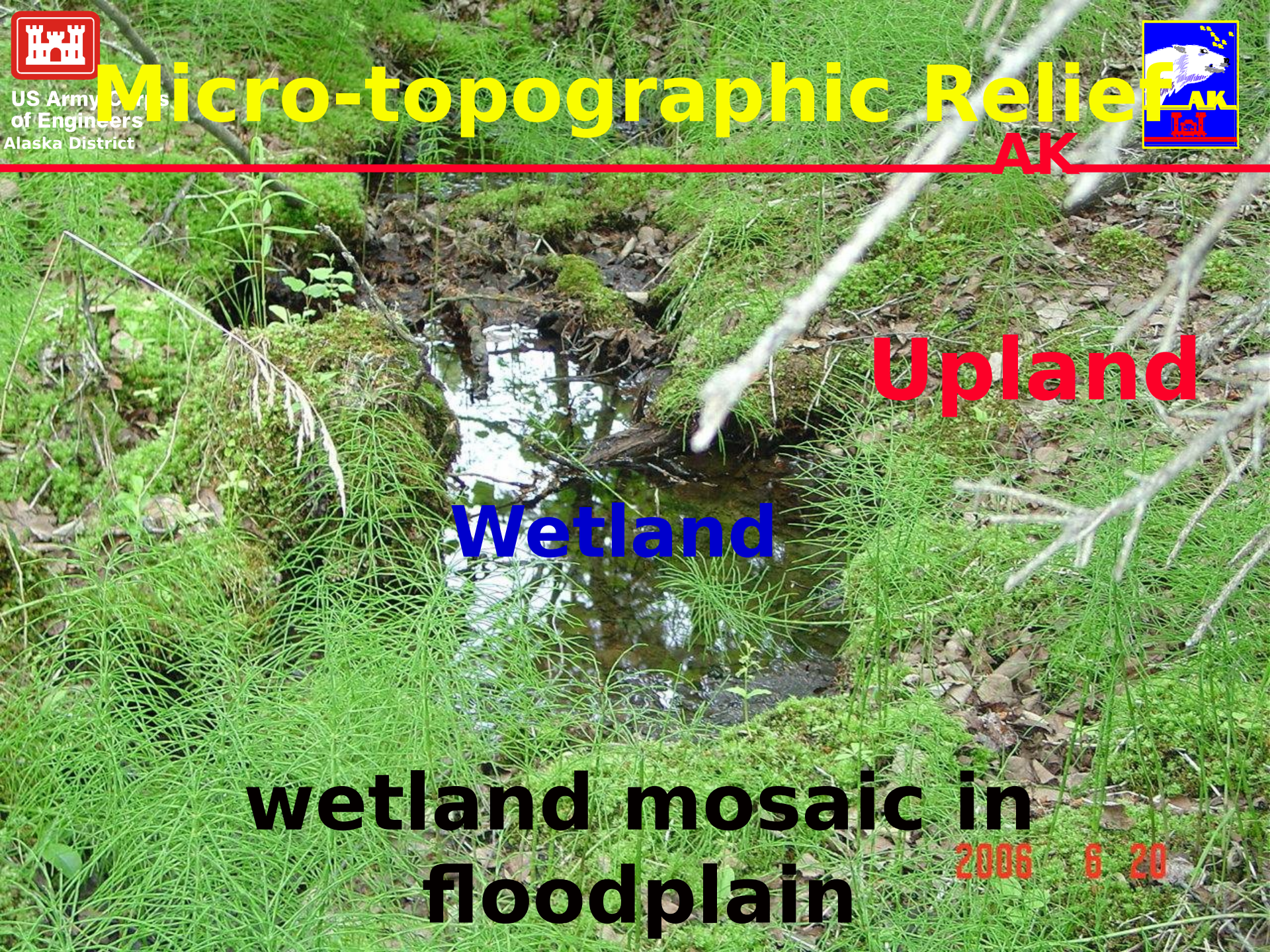
Wetland Hydrology

AK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Micro-topographic Relief
AK
Upland
Wetland
wetland mosaic in
floodplain
2006 6 20

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Wetland Hydrology

AK

Microtopographic Relief

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Fac-Neutral Test

AK

Toss out the FAC indicator species in your plot count. Count the number of OBL and FACW plant species. If there's more than the number of FACU and UPL indicator species, then you have a positive hydrology indicator.

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Wetland Hydrology

AK

- Why is wetland hydrology so important?
- What are the major hydrologic regimes?
- How long for inundation/saturation?
- What Group has strongest/weakest indicators?
- How many primary/secondary indicators does it take to meet the hydrology characteristic?
- How do you determine soil saturation?
- How do you find a shallow aquitard?
- What is groundwater discharge?
- What color is oxidized/reduced iron?
- When should you smell for rotten eggs?